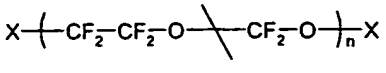
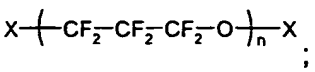
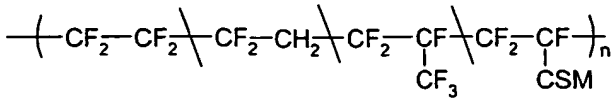

, and

;

wherein X is present or absent, and when present comprises an endcapping group.

6. The method of Claim 4, wherein the fluoroolefin material is selected from the group consisting of: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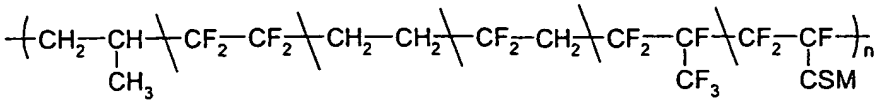
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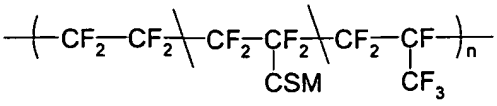
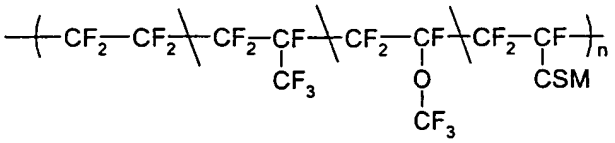
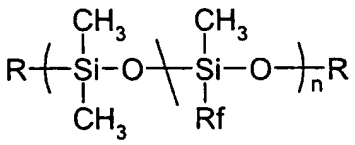

, and


,

wherein CSM comprises a cure site monomer.

7. The method of Claim 4, wherein the fluoroolefin material is made from monomers which comprise tetrafluoroethylene, vinylidene fluoride, hexafluoropropylene, 2,2-bis(trifluoromethyl)-4,5-difluoro-1,3-dioxole, a functional fluoroolefin, functional acrylic monomer, and a functional methacrylic monomer.

8. The method of Claim 4, wherein the silicone material comprises a fluoroalkyl functionalized polydimethylsiloxane (PDMS) having the following structure:



wherein:

R is selected from the group consisting of an acrylate, a methacrylate, and a vinyl group; and

Rf comprises a fluoroalkyl chain.

50. The plurality of particles of Claim 49, wherein the plurality of particles comprises a plurality of monodisperse particles.

51. The particle or plurality of particles of Claim 49, wherein the particle or plurality of particles is selected from the group consisting of a semiconductor device, a crystal, a drug delivery vector, a gene delivery vector, a disease detecting device, a disease locating device, a photovoltaic device, a solar cell device, a porogen, a cosmetic, an electret, an additive, a catalyst, a sensor, a detoxifying agent, an abrasive, a micro-electro-mechanical system (MEMS), a cellular scaffold, a taggant, a pharmaceutical agent, and a biomarker.

52. The particle or plurality of particles of Claim 49, wherein the particle or plurality of particles comprise a freestanding structure.

53. The method of Claim 1, comprising forming a multi-dimensional structure, the method comprising:

(a) providing a particle of Claim 49;

(b) providing a second patterned template;

(c) disposing a second liquid material in the second patterned template;

(d) contacting the second patterned template with the particle of step (a); and

(e) treating the second liquid material to form a multi-dimensional structure.

54. The method of Claim 1, comprising forming an interconnected structure.

55. The method of Claim 54, wherein the interconnected structure comprises a plurality of shape and size specific holes.

56. The method of Claim 55, wherein the interconnected structure comprises a membrane.

57. A method for delivering a therapeutic agent to a target, the method comprising:

(a) providing a particle of Claim 49;

(b) admixing the therapeutic agent with the particle; and

(c) delivering the particle comprising the therapeutic agent to the target.

58. The method of Claim 57, wherein the therapeutic agent is selected from one of a drug and genetic material.

59. The method of Claim 58, wherein the genetic material is selected from the group consisting of a non-viral gene vector, DNA, RNA, RNAi, and a viral particle.

60. The method of Claim 57, wherein the particle comprises a biodegradable polymer.

61. The method of Claim 60, wherein the biodegradable polymer is selected from the group consisting of a polyester, a polyanhydride, a polyamide, a phosphorous-based polymer, a poly(cyanoacrylate), a polyurethane, a polyorthoester, a polydihydropyran, and a polyacetal.

62. The method of Claim 61, wherein the polyester is selected from the group consisting of polylactic acid, polyglycolic acid, poly(hydroxybutyrate), poly(ϵ-caprolactone), poly(β-malic acid), and poly(dioxanones).

63. The method of Claim 61, wherein the polyanhydride is selected from the group consisting of poly(sebacic acid), poly(adipic acid), and poly(terpthalic acid).

64. The method of Claim 61, wherein the polyamide is selected from the group consisting of poly(imino carbonates) and polyaminoacids.

65. The method of Claim 61, wherein the phosphorous-based polymer is selected from the group consisting of a polyphosphate, a polyphosphonate, and a polyphosphazene.

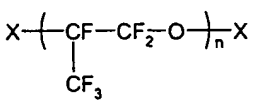
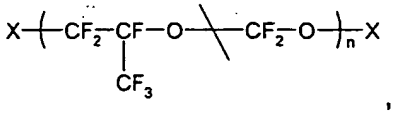
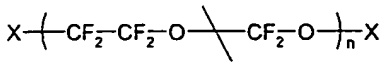
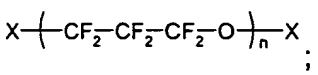
66. The method of Claim 60, wherein the biodegradable polymer further comprises a polymer that is responsive to a stimulus.

67. The method of Claim 66, wherein the stimulus is selected from the group consisting of pH, radiation, ionic strength, temperature, an alternating magnetic field, and an alternating electric field.

68. The method of Claim 67, wherein the stimulus comprises an alternating magnetic field.

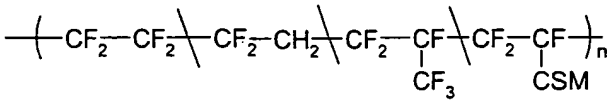
78. The method of Claim 76, wherein at least one of the patterned template and substrate comprises a material selected from the group consisting of a perfluoropolyether material, a fluoroolefin material, an acrylate material, a silicone material, a styrenic material, a fluorinated thermoplastic elastomer (TPE), a triazine fluoropolymer, a perfluorocyclobutyl material, a fluorinated epoxy resin, and a fluorinated monomer or fluorinated oligomer that can be polymerized or crosslinked by a metathesis polymerization reaction.

79. The method of Claim 78, wherein the perfluoropolyether material comprises a backbone structure selected from the group consisting of:


,

,

, and

;

wherein X is present or absent, and when present comprises an endcapping group.

80. The method of Claim 78, wherein the fluoroolefin material is selected from the group consisting of: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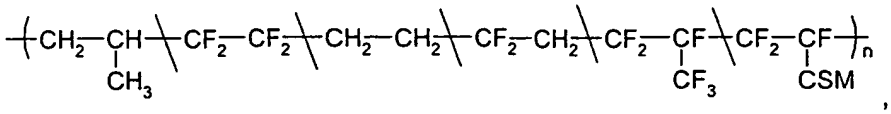
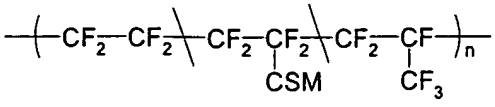
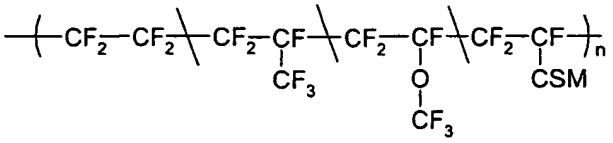
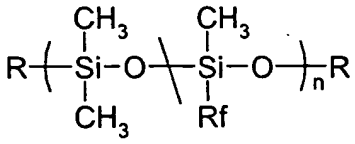

,

, and

,

wherein CSM comprises a cure site monomer.

81. The method of Claim 78 wherein the fluoroolefin material is made from monomers which comprise tetrafluoroethylene, vinylidene fluoride,

hexafluoropropylene, 2,2-bis(trifluoromethyl)-4,5-difluoro-1,3-dioxole, a functional fluoroolefin, functional acrylic monomer, and a functional methacrylic monomer.

82. The method of Claim 78, wherein the silicone material comprises a fluoroalkyl functionalized polydimethylsiloxane (PDMS) having the following structure:

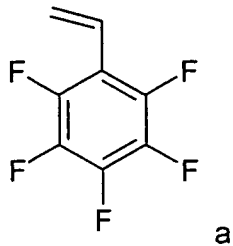


wherein:

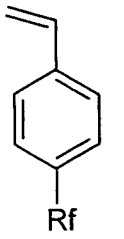
R is selected from the group consisting of an acrylate, a methacrylate, and a vinyl group; and

Rf comprises a fluoroalkyl chain.

83. The method of Claim 78, wherein the styrenic material comprises a fluorinated styrene monomer selected from the group consisting of:

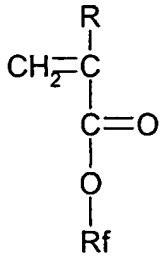


and



wherein Rf comprises a fluoroalkyl chain.

84. The method of Claim 78, wherein the acrylate material comprises a fluorinated acrylate or a fluorinated methacrylate having the following structure:



wherein:

97. The method of Claim 94, wherein the plurality of structural features has a dimension ranging from about 1 micron to about 100 nm in size.

98. The method of Claim 94, wherein the plurality of structural features has a dimension ranging from about 100 nm to about 1 nm in size.

99. The method of Claim 76, wherein the liquid material is selected from the group consisting of a polymer, a solution, a monomer, a plurality of monomers, a polymerization initiator, a polymerization catalyst, an inorganic precursor, a metal precursor, a pharmaceutical agent, a tag, a magnetic material, a paramagnetic material, a superparamagnetic material, a ligand, a cell penetrating peptide, a porogen, a surfactant, a plurality of immiscible liquids, a solvent, and a charged species.

100. The method of Claim 99, wherein the pharmaceutical agent is selected from the group consisting of a drug, a peptide, RNAi, and DNA.

101. The method of Claim 99, wherein the tag is selected from the group consisting of a fluorescence tag, a radiolabeled tag, and a contrast agent.

102. The method of Claim 99, wherein the ligand comprises a cell targeting peptide.

103. The method of Claim 76, wherein the liquid material is selected from one of a resist polymer and a low-k dielectric.

104. The method of Claim 76, wherein the liquid material comprises a non-wetting agent.

105. The method of Claim 76, wherein the disposing of the volume of liquid material is regulated by a spreading process.

106. The method of Claim 105, wherein the spreading process comprises:

(a) disposing a first volume of liquid material on the patterned template to form a layer of liquid material on the patterned template; and

(b) drawing an implement across the layer of liquid material to:

(i) remove a second volume of liquid material from the layer of liquid material on the patterned template; and